INKEL

MIXER AUDIO
MX991

Service Manual

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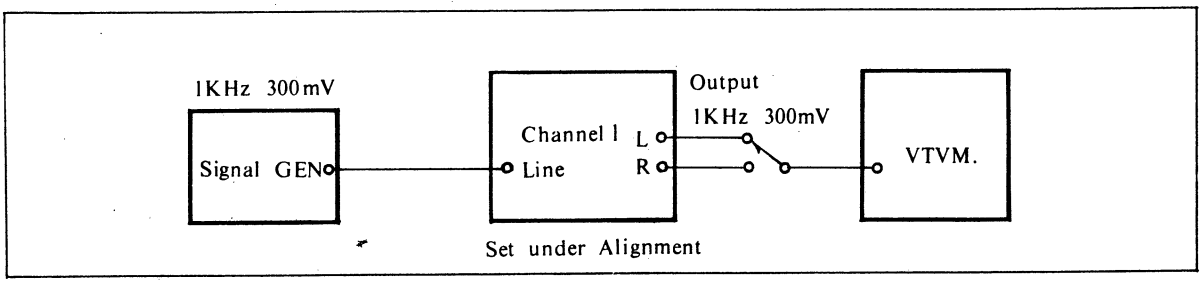
ELECTRICAL ADJUSTMENT PROCEDURE

1. OUTPUT LEVEL METER ADJUSTMENT

A. SETTING (CHANNEL 1)

Function switch : Line
Bass control : Center
Treble control : Center
Pan control : Center
Echo control : Min
Input Volume control: 7 Position

B. CONNECTION



C. ADJUSTMENT

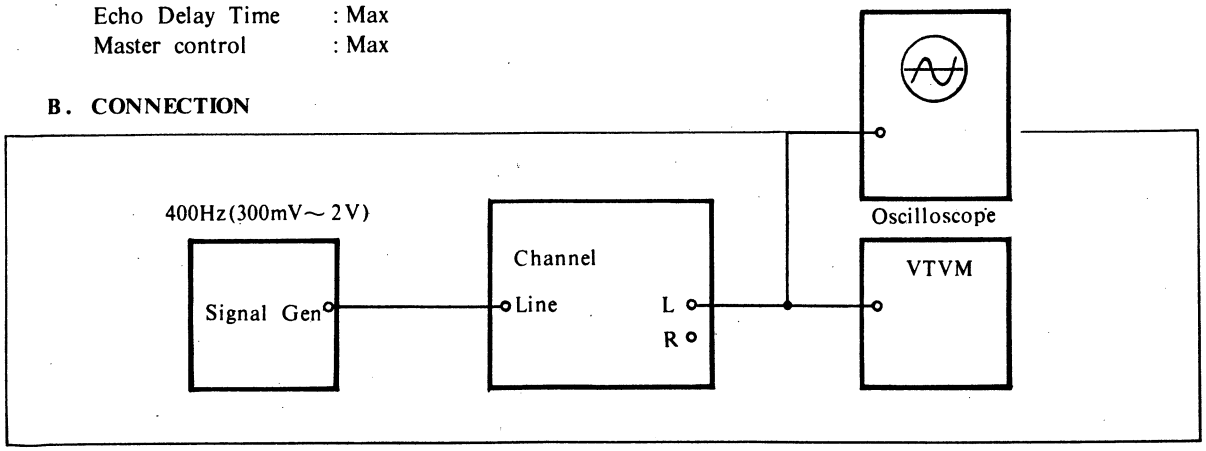
(1) Apply a 1KHz input signal of 300mV.
(2) Adjust the master volume so that output voltage is 300mV.
(3) Adjust VR202L/R so that output level meter indicate "0dB" position.

2. ECHO ADJUSTMENT

A. SETTING (CHANNEL 1)

Function switch : Line
Bass control : Center
Treble control : Center
Pan control : "10R" Position
Echo control : Max
Input Volume control : Max
Echo Master : Max
Echo Repeat : Max
Echo Delay Time : Max
Master control : Max

B. CONNECTION



C. ADJUSTMENT

Adjust the signal generator and VR301 until the L-channel output waveform becomes maximum.

PARTS LIST

K-40382 INPUT BOARD

Ref. No.	Parts No.	Description	Q'ty
IC101	2168007105	IC TA 7136P	1
IC102a·b	2168220100	IC NJM 4558DD	1
R113, R114	3009560273	Resistor Carbon 56 ohm 1/4 W	4
R127, R128			
R103, R109	3009101273	Resistor Carbon 100 ohm 1/4 W	2
R125	3009102273	Resistor Carbon 1K ohm 1/4 W	1
R108	3009132273	Resistor Carbon 1.3K ohm 1/4 W	1
R121	3009272273	Resistor Carbon 2.7K ohm 1/4 W	1
R123, R126	3009332273	Resistor Carbon 3.3K ohm 1/4 W	2
R101	3009682273	Resistor Carbon 6.8K ohm 1/4 W	1
R119, R120	3009103273	Resistor Carbon 10K ohm 1/4 W	5
R122, R124			
R132			
R102	3009123273	Resistor Carbon 12K ohm 1/4 W	1
R115, R130	3009223273	Resistor Carbon 22K ohm 1/4 W	3
R131			
R106, R112	3009823273	Resistor Carbon 82K ohm 1/4 W	2
R104, R105	3009104273	Resistor Carbon 100K ohm 1/4 W	5
R116, R117			
R118			
R110, R111	3009274273	Resistor Carbon 270K ohm 1/4 W	2
R129	3009334273	Resistor Carbon 330K ohm 1/4 W	1
R107	3009824273	Resistor Carbon 820K ohm 1/4 W	1
C101, C111	3409210970	Capacitor Elect. 1μF/50WV	2
C105, C106	3409247940	Capacitor Elect. 4.7μF/25WV	2
C115	3409210030	Capacitor Elect. 10μF/16WV	1
C118	3409222030	Capacitor Elect. 22μF/16WV	1
C109, C110	3409247030	Capacitor Elect. 47μF/16WV	4
C117, C119			
C112	3509809130	Capacitor Ceramic 8PF/50WV	1
C104	3509100130	Capacitor Ceramic 10PF/50WV	1
C103	3509470130	Capacitor Ceramic 47PF/50WV	1
C102	3509471130	Capacitor Ceramic 470PF/50WV	1
C107	3609332110	Capacitor Mylar 0.0033μF/50WV	1
C113, C114	3609104110	Capacitor Mylar 0.1μF/50WV	2
C116	3609682110	Capacitor Mylar 0.0068μF/50WV	1
C108	3619102110	Capacitor Poly 1000PF/50WV	1

K-40383 MONITOR BOARD

Ref. No.	Parts No.	Description	Q'ty
IC201L/R	2168220100	IC NJM 4558DD	2
Q403L/R	2008609101	Transistor MPS A05	2
Q402L/R	2008209101	Transistor MPS A55	2
Q201L/R	2008609107	Transistor MPS 9633C	4
Q401L/R			
Q504	2008607104	Transistor 2SC 1815Y	1
Q503	2008606105	Transistor 2SA 1015Y	1
Q202L/R	2018206109	FET 2SK 30A	2
D201L/R	2058306101	Diode 1N4148/CDG24	6
D202L/R			
D401L/R			
R408L/R	3009100273	Resistor Carbon 10 ohm 1/4 W	2
R404L/R	3009330273	Resistor Carbon 33 ohm 1/4 W	4
R407L/R			
R517	3009470273	Resistor Carbon 47 ohm 1/4 W	1
R201, R213	3009560273	Resistor Carbon 56 ohm 1/4 W	2
R218L/R	3009680273	Resistor Carbon 68 ohm 1/4 W	2
R205L/R	3009101273	Resistor Carbon 100 ohm 1/4 W	6
R210L/R			
R409L/R			
R206L/R	3009102273	Resistor Carbon 1K ohm 1/4 W	8
R207L/R			
R401L/R			
R406L/R			
R405L/R	3009152273	Resistor Carbon 1.5K ohm 1/4 W	2
R208L/R	3009182273	Resistor Carbon 1.8K ohm 1/4 W	2
R215L/R	3009222273	Resistor Carbon 2.2K ohm 1/4 W	2
R214L/R	3009332273	Resistor Carbon 3.3K ohm 1/4 W	2
R513	3009472273	Resistor Carbon 4.7K ohm 1/4 W	1
R217L/R	3009822273	Resistor Carbon 8.2K ohm 1/4 W	2
R211L/R	3009103273	Resistor Carbon 10K ohm 1/4 W	4
R508, R509			
R203L/R	3009223273	Resistor Carbon 22K ohm 1/4 W	2
R204L/R	3009473273	Resistor Carbon 47K ohm 1/4 W	4
R209L/R			
R216L/R	3009563273	Resistor Carbon 56K ohm 1/4 W	2
R219L/R	3009683273	Resistor Carbon 68K ohm 1/4 W	2
R510, R512	3009823273	Resistor Carbon 82K ohm 1/4 W	2
R511	3009104273	Resistor Carbon 100K ohm 1/4 W	1
R202L/R	3009224273	Resistor Carbon 220K ohm 1/4 W	7
R212L/R			
R402L/R			
R514			
R403L/R	3009105273	Resistor Carbon 1M ohm 1/4 W	2
R515, R516	3009335273	Resistor Carbon 3.3M ohm 1/4 W	2
C209L/R	3409210970	Capacitor Elect. 1μF/50WV	4
C401L/R			
C201L/R	3409247940	Capacitor Elect. 4.7μF/25WV	13
C204L/R			
C206L/R			
C207L/R			
C208L/R			
C402L/R			
C508			
C210L/R	3409210030	Capacitor Elect. 10μF/16WV	3
C509			
C205L/R	3409222030	Capacitor Elect. 22μF/16WV	2
C202, C203	3409247030	Capacitor Elect. 47μF/16WV	2
C403L/R	3409247120	Capacitor Elect. 470μF/10WV	2

PARTS LIST

C404L/R	3509470130	Capacitor Ceramic 47PF/50WV	2	C211L/R	3509680130	Capacitor Ceramic 68PF/50WV	2

K-40384 ECHO BOARD

Ref. No.	Parts No.	Description	Q'ty	Ref. No.	Parts No.	Description	Q'ty
IC301a·b	2168220100	IC NJM 4558DD	2	R302, R310	3009104273	Resistor Carbon 100K ohm 1/4 W	3
IC304a·b				R312			
IC302	2168010101	IC MN 3005	1	R303, R307	3009124273	Resistor Carbon 120K ohm 1/4 W	4
IC303	2168010102	IC MN 3101	1	R317, R325			
Q301	2008609107	Transistor MPS 9633C	1	R327	3009224273	Resistor Carbon 220K ohm 1/4 W	1
Q501	2028409100	Transistor MDS 9400	1	R321, R322	3009155273	Resistor Carbon 1.5M ohm 1/4 W	2
Q502	2028109100	Transistor MDS 9450	1	C301, C303	3409233970	Capacitor Elect. 3.3μF/50WV	8
D503, D504	2058106100	Diode Rect. 1N4002	5	C309, C310			
D505, D506				C311, C319			
D507				C320, C321			
D301, D302	2058306101	Diode 1N4148/CDG24	2	C318	3409247940	Capacitor Elect. 4.7μF/25WV	1
D501, D502	2058520109	Diode Zener WZ-140	2	C322, C501	3409210130	Capacitor Elect. 100μF/16WV	3
R501, R502	3039220472	Resistor Metal Oxide 22 ohm 1W	2	C502			
R328, R503	3009101273	Resistor Carbon 100 ohm 1/4 W	3	C503, C504	3409222130	Capacitor Elect. 220μF/16WV	2
R504				C505, C506	3409247140	Capacitor Elect. 470μF/25WV	2
R505, R506	3009681273	Resistor Carbon 680 ohm 1/4 W	2	C507	3509103130	Capacitor Ceramic 0.01μF/50WV	1
R320	3009102273	Resistor Carbon 1K ohm 1/4 W	1	C315	3509121130	Capacitor Ceramic 120PF/50WV	1
R323	3009272273	Resistor Carbon 2.7K ohm 1/4 W	1	C304, C307	3509221130	Capacitor Ceramic 220PF/50WV	2
R507	3009472273	Resistor Carbon 4.7K ohm 1/4 W	1	C302, C305	3609332110	Capacitor Mylar 0.0033μF/50WV	3
R309, R311	3009562273	Resistor Carbon 5.6K ohm 1/4 W	5	C306			
R313,				C313	3609222110	Capacitor Mylar 0.0022μF/50WV	1
R324L/R				C314, C317	3609252110	Capacitor Mylar 0.0025μF/50WV	2
R318, R319	3009273273	Resistor Carbon 27K ohm 1/4 W	2	C316	3609682110	Capacitor Mylar 0.0068μF/50WV	1
R306, R316	3009333273	Resistor Carbon 33K ohm 1/4 W	2	C312	3609182110	Capacitor Mylar 0.0018μF/50WV	1
R314, R315	3009393273	Resistor Carbon 39K ohm 1/4 W	2	C308	3619561110	Capacitor Poly 560PF/50WV	1
R301, R308	3009473273	Resistor Carbon 47K ohm 1/4 W	3	FS501	5508300434	Secondary Fuse Time Lag	2
R329				FS502		T50mA/250V(20mm) For EU, BSI	
R304, R305	3009563273	Resistor Carbon 56K ohm 1/4 W	2		5508211633	Secondary Fuse STD 0.5A/250V	2
R326	300982373	Resistor Carbon 82K ohm 1/4 W	1			(31.8mm) For UL	

CHASSIS MOUNTING

Ref. No.	Parts No.	Description	Q'ty	Ref. No.	Parts No.	Description	Q'ty
	2828018211	Power Transformer	1		5508211633	Lamp Fuse STD 0.5A/250V(31.8mm)	1
C510	3549472407	Capacitor Ceramic 0.0047μF/400VAC	1			For UL	
FS505	5508300834	Lamp Fuse Time Lag T125mA/250V	1		2808000100	MIC MATCHING TRANS THS-10	1
		(20mm) For EU, BSI					

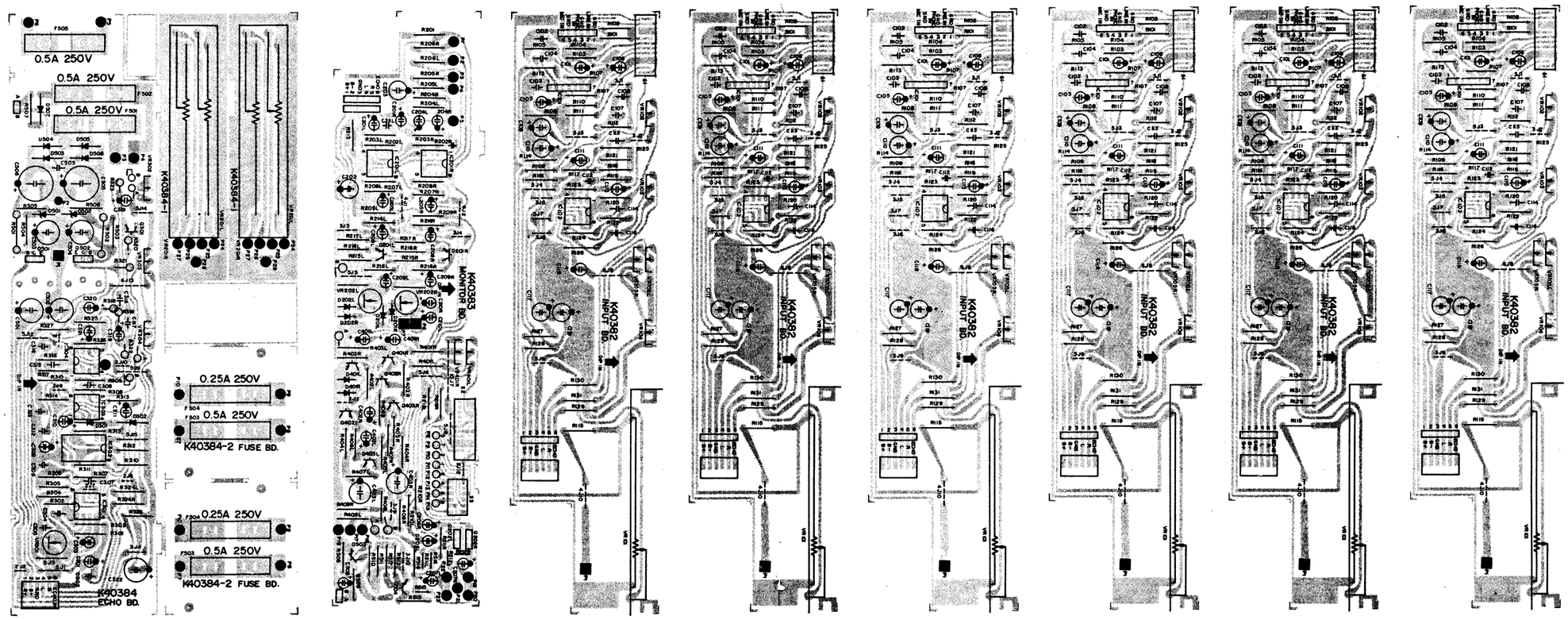
NOTE: As to UL, EU and BSI marked in the parts list, note the followings;

Type	Voltage	Remarks
UL	120V	U. S. A model
EU	220V	Europe model
BSI	240V	England model

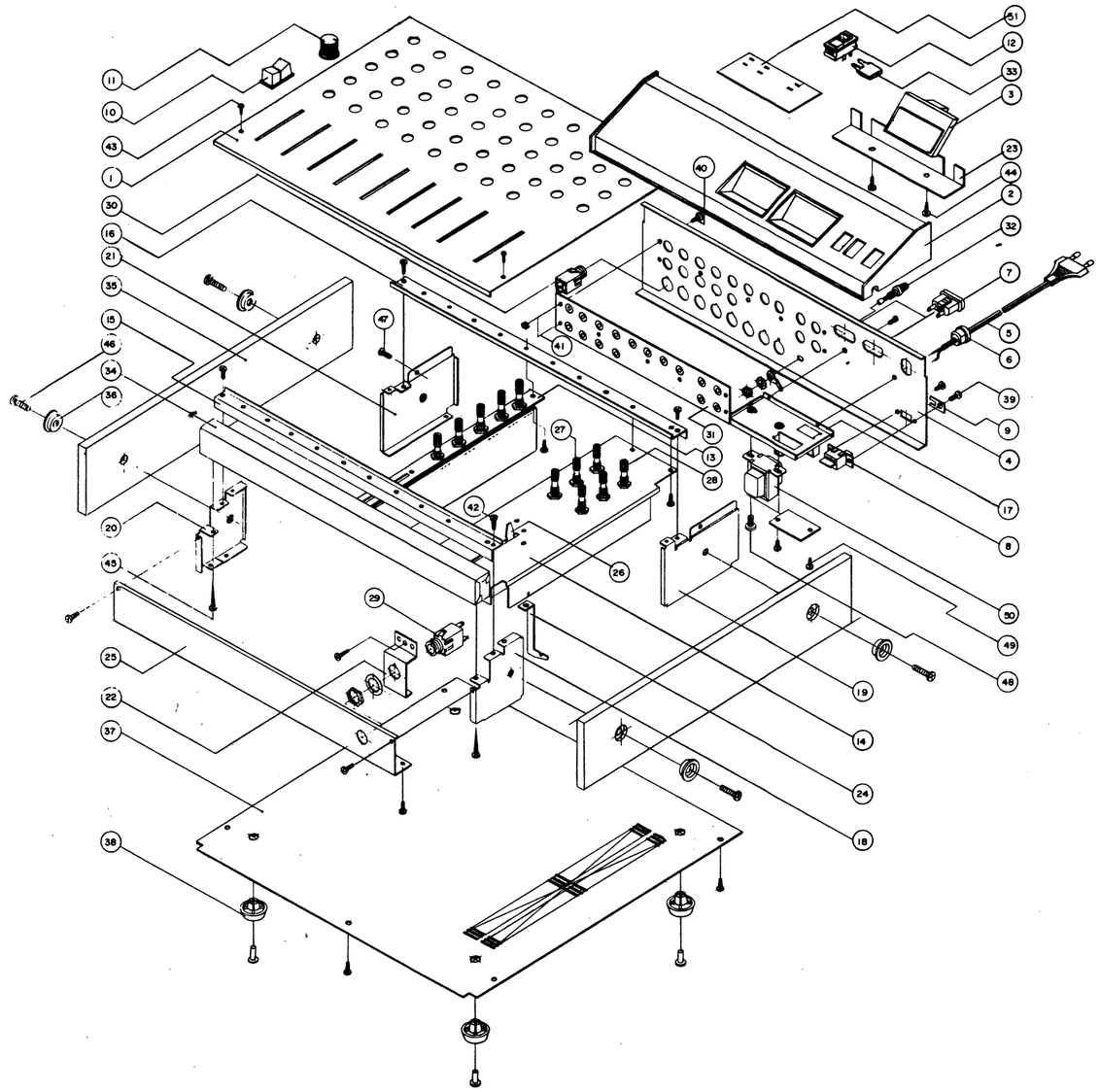
PARTS LIST ACCORDING TO EXPLODED VIEW

NO.	PARTS NO.	DESCRIPTION	Q'TY	NO.	PARTS NO.	DESCRIPTION	Q'TY
1	PC-62453	TOP COVER	1	24	PE-68753-01A	P.C.B BRACKET	1
2	PD-61176	FRONT COVER	1	25	PD-62447A	FRONT CHASSIS	4
3	PD-75053	METER	2	26	PE-15119	SLIDE POTENTIOMETER	9
4	PC-62449	BACK CHASSIS	1	27	PE-90314	SELECTOR SW.	10
5	4308001510	AC CORD FOR UL	1	28	PD-15121-7	POTENTIOMETER	36
	PE-67031	AC CORD FOR BSI	1	29	PE-95035	PHONE JACK	1
	PE-67051-03	AC CORD FOR EU	1	30	PE-95025	MIC JACK	8
6	PE-71050	AC CORD STOPPER FOR UL, BSI	1	31	PD-95117	R.C.A JACK	1
	PE-71008A	AC CORD STOPPER FOR EU	1	32	AD-70052	SYSTEM GROUND ASS'Y	1
7	PC-75079-02	RECEPTACLE	2	33	PE-77070	CAPACITOR TUBE	4
8	PD-90277	VOLTAGE SELECTOR SW. FOR DOMESTIC	1	34	PD-74358	FRONT BAR	1
9	PE-69101-02	VOLTAGE HOLDER FOR DOMESTIC	1	35	PD-74359	WOODEN PLATE	2
10	PD-72316	SLIDE KNOB	9	36	PD-66041-01	MOLD WASHER	4
11	PE-72317	CONTROL KNOB	46	37	PC-62448	BOTTOM COVER	1
12	78104	POWER SW.	1	38	AE-71053	FOOT ASS'Y	4
13	PD-62450	SUPPORT FRAME A	1	39		SCREW #3x6(B)	8
14	PD-62445	SUPPORT FRAME B	8	40		SCREW #3 PTC 3x8(B)	8
15	PC-62446	TOP FRAME A	1	41		NUT M3	6
16	PC-62470	TOP FRAME B	1	42		SCREW #3 BTC 3x6	60
17	PD-68750	TRANS. BRACKET	1	43		SCREW #3 BTC 26x6(B)	6
18	PD-62451-01	FRAME A	1	44		SCREW BTC 3x8	3
19	PD-62452-01	FRAME B	1	45		SCREW #1 PT 3x10	2
20	PD-62451-02	FRAME A	1	46		SCREW BM 4x20(B)	4
21	PD-62452-02	FRAME B	1	47		SCREW #3 FTC 3x6	2
22	PE-68751	PHONE JACK BRACKET	1	48		SCREW WPM 4x10	2
23	PD-68749A	METER BRACKET	1	49		SCREW WPTC 3x6	2

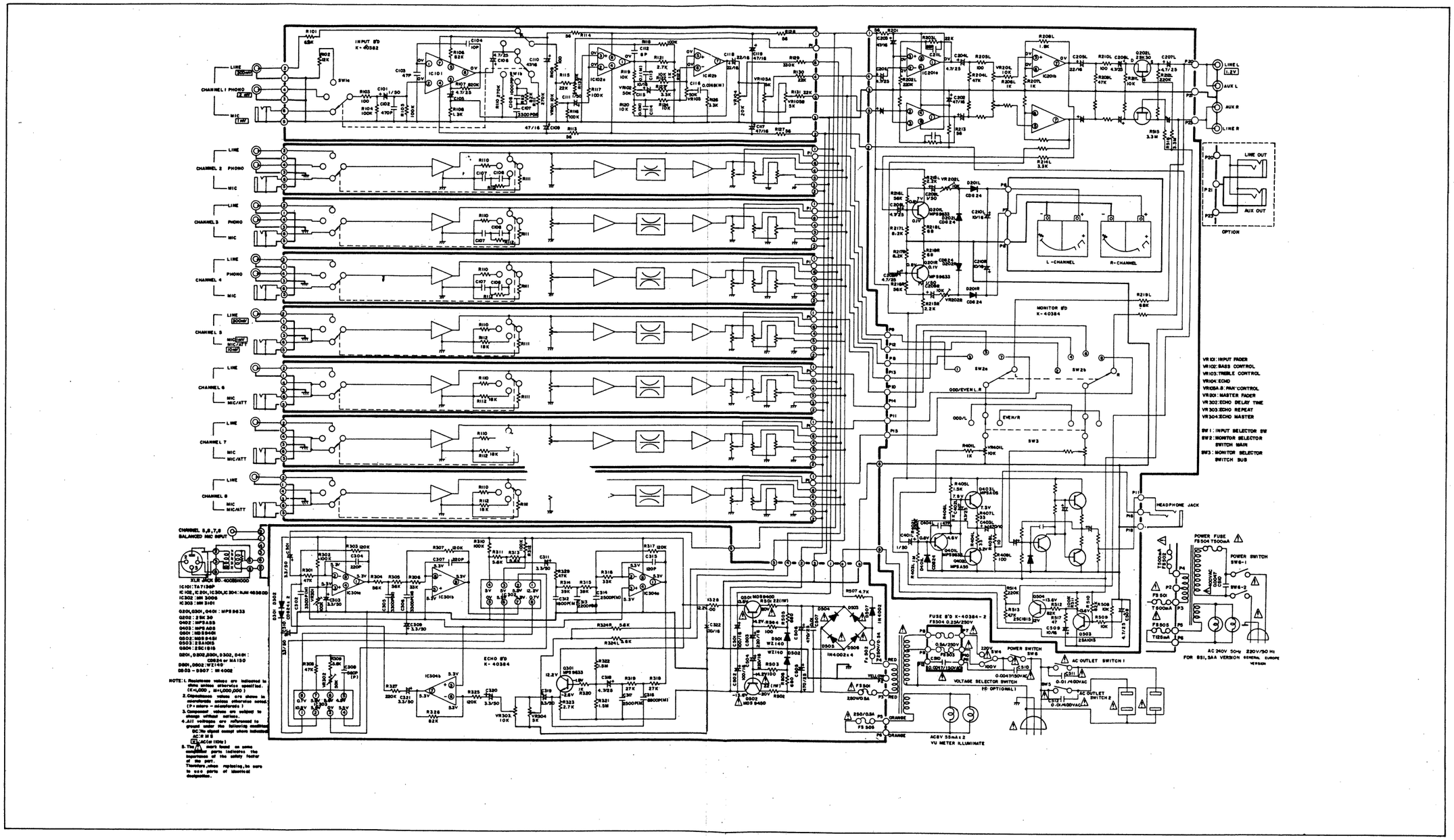
TOP VIEW OF P.C. BOARDS



EXPLODED VIEW OF CABINET AND CHASSIS



SCHEMATIC DIAGRAM



VR101: INPUT FADER
VR102: BASS CONTROL
VR103: TREBLE CONTROL
VR104: ECHO
VR105A,B: PAN CONTROL
VR201: MASTER FADER
VR302: ECHO DELAY TIME
VR303: ECHO REPEAT
VR304: ECHO MASTER

SW1: INPUT SELECTOR SW
SW2: MONITOR SELECTOR SWITCH MAIN
SW3: MONITOR SELECTOR SWITCH SUB

IC101: TA7136P
IC102, IC201, IC301, IC304: NJM 4558D
IC302: MM 5065
IC303: MM 5101

Q201, Q301, Q401: MPS 9633
Q202: 2SK 30
Q402: MPS A55
Q403: MPS A05
Q501: MD 8460
Q502: MPS 8451
Q503: 2SA1015
Q504: 2SC1815

D201, D202, D501, D502, D401: GI924 or HA150
D601, D602: WZ140
D503 - D507: IN 4002

NOTE: 1. Resistance values are indicated in ohms unless otherwise specified. (K=1,000, M=1,000,000)
2. Capacitance values are shown in microfarads unless otherwise noted. (P=micro-microfarads)
3. Component values are subject to change without notice.
4. All voltages are referenced to ground under the following conditions: DC: No signal except where indicated. AC: At 0 V (AC for 100v)
5. The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.

SPECIFICATIONS

RATED OUTPUT VOLTAGE	1.2V
PHONO AT 1KHz 2mV	
MIC ATT 1KHz 10mV	
LINE 1KHz 300mV	
MIC 1KHz 1mV	
MAX OUTPUT VOLTAGE AT 1KHz	
WITH NO MORE THAN 0.06% THD	7V
TOTAL HARMONIC DISTORTION AT 20Hz-20KHz	
1.2V RMS OUTPUT	0.03%
FREQUENCY RESPONSE AT —3dB	
MIC ATT	15-30K
LINE	15-30K
MIC	15-30K
INPUT OVERLOAD AT 1KHz CLIPPING POINT	
PHONO	100mV
MIC ATT	500mV
LINE	15V
MIC	50mV
S/N RATIO(IHF "A" WTD/UN WTD)	
PHONO	72/65dB
MIC ATT	76/70dB
LINE	76/70dB
MIC	61/58dB
TONE CONTROL BASS AT 100Hz	10dB
TREBLE AT 10KHz	10dB
PHONO EQUALIZATION 30Hz-15KHz	RIAA ±1dB
HEAD PHONE OUTPUT	1.5mW
AT 1KHz 8 OHM LOAD	
ECHO EFFECT	
DELAY TIME	0.04-0.4 SEC
ECHO REPEAT	1-7

NOTE: Specifications and the design subject to change without notice for improvements.